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**Statement of
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Before the

**Subcommittee on Aviation
Committee on Transportation and Infrastructure
U.S. House of Representatives**

**Hearing on Aviation and Environment: Noise
October 24, 2007**

Mr. Chairman and members of the subcommittee, my name is Alan Epstein and I am the Vice President of Technology and Environment for Pratt & Whitney. Pratt & Whitney is a world leader in the design, manufacture and service of aircraft engines, industrial gas turbines and space propulsion systems. Pratt & Whitney has been producing airplane engines for over 80 years and rocket engines for this nation's space program for over 40 years. We take great pride in the company motto, Dependable Engines, because that's what we've been building for 82-plus years. Pratt & Whitney is part of United Technologies Corporation, a global technology corporation with a long history of pioneering innovation in aerospace, aviation, helicopter design, climate control, elevator design and hydrogen fuel cells.

I appreciate the opportunity to participate in this hearing addressing aviation noise, one of the most significant challenges facing U.S. commercial aviation. Other witnesses at today's hearing addressed the importance of modernizing this country's air traffic control system and associated initiatives on aircraft routing and other noise abatement procedures. These are necessary and wise investments that the nation must make to ensure the health of commercial aviation, the convenience of the traveling public, and the well being of our airport's local communities. I am here to speak about an innovative, complementary approach to reducing community noise, employing technological advances which will dramatically reduce the noise and emissions made by future aircraft engines.

The first commercial jet engines were designed over 50 years ago with little regard to noise. Producing sound levels similar to being next to the speakers at a live

rock concert, they quickly proved unacceptable to the communities around airports. The introduction of the first turbofan engines helped reduce noise and each succeeding generation has reduced the noise footprint further. According to the December 2004 Report to the United States Congress, "Aviation and the Environment – A National Visions Statement, Framework for Goals and Recommended Actions," we have collectively achieved a 95% reduction in the number of people impacted by aircraft noise over the last 35 years. However, we can do even better. Our national goal should be to eliminate aircraft noise as a concern of communities near airports.

Aircraft design has always involved some compromise between producing the lowest noise, improving fuel efficiency and delivering the best operating cost. While low noise has been an important factor, the aircraft design must be economically viable to enable public transportation at the competitive ticket prices that the flying public has come to expect. In response to this challenge, Pratt & Whitney developed Geared Turbofan™ engine technology in order to rebalance this design compromise so that the engine simultaneously achieves optimal economy and lower noise. This is especially important for the shorter range, narrow-body commercial aircraft that are responsible for most of the country's airline operations. Thus, airlines that are generally motivated to choose engines with the best financial impact will also be buying very quiet airplanes.

At Pratt & Whitney, we are very excited about our new Geared Turbofan engine for the next generation of passenger aircraft. The Geared Turbofan engine promises a new level of very low noise while offering the airlines superior economics and environmental performance. For aircraft of 70 to 150 passenger size, the Geared Turbofan engine reduces the fuel burned, and thus the CO₂ produced, by more than 12% compared to today's aircraft, while reducing cumulative noise levels about 20dB below the current Stage 4 regulations. This noise level, which is about half the level of today's engines, is the equivalent difference between standing near a garbage disposal running and listening to the sound of my voice right now.

This technology is not in the distant future. We announced earlier this month that our Geared Turbofan engine has been selected as the exclusive engine for the new Mitsubishi Regional Jet. We are currently building a Geared Turbofan engine that will ground test later this year and flight test in 2008. Aircraft with Geared Turbofan engines will be entering service in the 2012 to 2013 timeframe. Pratt & Whitney's technology and innovation doesn't stop there. In fact, Pratt & Whitney will apply this technology to a family of next generation engines that will power applications from regional jets to single aisle aircraft and wide body aircraft.

There is significant synergy between improved air-traffic control capabilities and the very low noise levels that Geared Turbofan engine-powered aircraft can deliver. The constraints of the presently overburdened air traffic control system, especially in congested urban areas, do not allow even exceptionally quiet aircraft to deviate from the existing traffic patterns. This prevents an airline operator from utilizing the optimum flight track for a very low noise aircraft and thus removes an incentive to make the investment needed to achieve exceptionally low noise fleets.

For example, airlines traveling to the east coast from Los Angeles take off due west at night to gain altitude to reduce the noise signature over the city. An aircraft powered with Pratt & Whitney Geared Turbofan engines flying the optimal flight path would produce less noise than today's aircraft at a higher-altitude. This would save an average of 12 minutes of flight time, reducing fuel cost and emissions.

A smaller, but still important improvement in emissions and noise can be realized immediately by keeping current engines on existing airplanes operating at their highest efficiency levels. Simple things like washing the interior of an aircraft engine are a cost effective approach to maximizing engine efficiency. Pratt & Whitney's new EcoPower engine water wash service lets airlines clean their engines, at the gate if desired, and captures the effluent to eliminate residue. This simple, environmentally responsible process can improve engine efficiency by one percent.

Recently, there has been much written concerning climate change and the role that aviation may play. At Pratt & Whitney, we believe that the exceptionally low noise levels that local communities deserve can be achieved without compromising other environmental goals such as reduced CO₂ and emissions. Our Geared Turbofan engine offers a balanced approach to engine noise, fuel efficiency and reduced emissions. We continue to work on more advanced technology that will offer still lower noise and fuel burn in the future. An advanced Geared Turbofan engine will deliver the low fuel burn and CO₂ output of the giant supersonic propellers now being studied, without the inherent noise disadvantages. Indeed in the future, it will be possible to design aircraft in which the primary noise sources are not the engines but are instead the airframe itself. But without adequate research support by the federal government, this technology may not become reality.

Aerospace continues to be, as it has been over several decades, this nation's largest manufacturing export. Our export sales have been so favorable because we have produced superior products using the most advanced technology. But, advanced technology is expensive to develop. Pratt & Whitney's Geared Turbofan engine incorporates 20 years of development experience and more than \$1 billion of technology investment. This is stockholders' money invested upfront, years before any revenue comes in. However, some of the foundational technologies underlying these engines were developed in partnership with the government, NASA in particular, over several decades. This historical partnership of government, universities, and private industry has benefited our country since aviation's inception over 100 years ago, making the United States the world leader in the highly competitive commercial and military aviation business.

Recently, I was at an international conference at which the European Union investment plans for civil aviation were presented. Frankly, I am worried that as other nations have increased their investment in fundamental aeronautical technologies, the corresponding U.S. investment has dropped precipitously, especially at NASA. This nation must invest in basic technology if it is to maintain its favorable aerospace balance

of trade, maintain employment, and significantly reduce aviation's environmental impact both on local communities and on the planet. Therefore, we strongly support such initiatives as the proposed FAA Continuous Low Emissions, Energy and Noise (CLEEN) program. However, even with CLEEN, our nation's investment in real dollars on fundamental civil aviation technologies is a tiny fraction of what it was twenty years ago. We must do more at both the FAA and NASA if the U.S. aerospace industry is to remain a world leader, especially in light of global competition and increasing concerns with the environment.

In summary, I would stress that it is important to take an integrated approach to reducing aviation's impact on the environment, in particular community noise. We can achieve dramatically reduced engine noise and CO₂ emissions and significantly improved economic performance in the near term with Pratt & Whitney's Geared Turbofan engine. The combination of new engine technology and modern air traffic control systems can make a real difference in the quality of life of around our airport communities, reduce emissions, and deliver significant economic benefits to the traveling public and airline industry.

Thank you again for the opportunity to address this important topic. I would be happy to answer any questions.